DETERMINATION OF RATE OF SPREAD TACK COAT

Lab ID	:	**CP-RW-2018-09-10-01** **Date: 11-09-18**
Customer	:	Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.
Address	:	Byatarayanapura Sub Division, BBMP, Bangalore
Project Name	:	Improvements to road and drains at Markandaiahnagara, Agrahara layout cross roads in ward No.05 in Thirumenhalli village Limits.
Agency	:	B.R.Dhananjaya, Contractor, Nagashetehalli, Bangalore-560094.
Customer Reference	:	EE/BTP/BBMP/E-PMT/592/2013-14
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	10-09-18
Sample ID No	:	2018-09-10-01/01
Type of Mix	:	Tack coat
Date of test	:	10-09-18

Sl.No	Determination	Unit	TEST 1	TEST 2
1	Size of Plate (mxm)	Mt	0.30 x .30	0.30 x .30
2	Area of Plate (a)	Sq.mtr	0.09	0.09
3	Initial Wt of empty Plate (b)	Kg	0.79	0.75
4	Final weight of plate after application of tack Coat (c)	Kg	0.813	0.773
5	Weight of tack Coat (d=c-b)	Kg	0.023	0.023
6	Rate of spread of tack coat	Kg/sq.m	0.256	0.256
7	Average	Kg/sq.m	0.256	
8	Specified Limit	Kg/sq.m	0.250 Kg/sq.m	

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TEST RESULTS OF STEEL

Lab ID	:	**CP-2018-08-02-01** **Date: 03-08-18**
Customer	:	Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.
Address	:	Byatarayanapura Sub Division, BBMP, Bangalore
Project Name	:	Improvements to road and drains at Markandaiahnagara, Agrahara layout cross roads in ward No.05 in Thirumenhalli village Limits.
Agency	:	B.R.Dhananjaya, Contractor, Nagashetehalli, Bangalore-560094.
Customer's Reference	:	EE/BTP/BBMP/E-PMT/592/2013-14
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	02-08-18
Sample ID No	:	2018-08-02-01 /04
Sample Type	:	Sunvik
Reference to BIS codes	:	IS 1786-2008, IS:1608-2005(RA 2011), IS 1599-2012.
Date of test:	:	02-08-18

Sl.No	Identification of sample	Grade of the sample	Diameter of the steel bar	Weight of the sample	Yield stress	Tensile strength	Elongation	Bend test	Rebend test
			(mm)	(kg/m)	(N/mm2)	(N/mm2)	(%)		
1	Sunvik	Fe500	8	0.391	528	641	21.0%	Satisfactory	Satisfactory
2	Sunvik	Fe500	10	0.611	539	658	20.5%	Satisfactory	Satisfactory
3	Sunvik	Fe500	12	0.885	552	672	20.0%	Satisfactory	Satisfactory

Note:

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TEST REPORT OF PRECAST COVER SLAB

Lab ID : **CP-2018-08-02-01** **Date: 06-08-18**

Customer : Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.

Address : Byatarayanapura Sub Division, BBMP, Bangalore

Project Name : Improvements to road and drains at Markandaiahnagara, Agrahara layout cross roads in ward No.05 in Thirumenhalli village Limits.

Agency : B.R.Dhananjaya, Contractor, Nagashetehalli, Bangalore-560094.

Customer's Reference : EE/BTP/BBMP/E-PMT/592/2013-14

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 02-08-18

Sample ID No : 2018-08-02-01 /06

Sample Type /Size : Precast Cover Slab

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete

Date of test : 02/08/2018

Sl. No.	Identification Mark	Diameter of the core	Height of the core	Weight of the core	Area	Failure Load	Core Compressive strength	Corrected Cylinder Compressive strength	Equivalent Cube Compressive strength
		(mm)	(mm)	(kg)	(Sq.mm)	(KN)	(N/mm^2)	(N/mm^2)	(N/mm^2)
1	Cover Slab-1	100.48	150.02	2.155	7928	151.2	19.1	17.7	22.2
2	Cover Slab-2	100.41	150.03	2.098	7917	149.9	18.9	17.6	22.0
3	Cover Slab-3	100.45	150.02	2.125	7923	153.5	19.4	18.0	22.5

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TEST RESULTS OF GRADATION FOR SDBC
IS 2386 (Part 1) 1963 (RA 2007)

Lab ID : **CP-RW-2018-09-03-01** **Date: 05-09-18**

Customer : Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.

Address : Byatarayanapura Sub Division, BBMP, Bangalore

Project Name : Improvements to road and drains at Markandaiahnagara, Agrahara layout cross roads in ward No.05 in Thirumenhalli village Limits.

Agency : B.R.Dhananjaya, Contractor, Nagashetehalli, Bangalore-560094.

Customer Reference : EE/BTP/BBMP/E-PMT/592/2013-14

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 03-09-18

Sample ID No : 2018-09-03-01/01

Type of Mix : SDBC-Plant (Semi Dense Bituminous Concrete)

Date of test : 03-09-18

Weight of Sample : 5000 Grams

IS Sieve Size (mm)	Weight Retained (gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-15(grading-2)
13.2	0	0	0.0	100.0	100
9.5	410	410	8.2	91.8	90-100
4.75	2187	2597	51.9	48.1	35-51
2.36	1038	3635	72.7	27.3	24-39
1.18	525	4160	83.2	16.8	15-30
0.3	503	4663	93.3	6.7	9-19
0.075	169	4832	96.6	3.4	3-8
PAN	168	5000	100.0	0.0	0

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TEST REPORT OF AGGEGRATE STRIPPING VALUE OF ROAD AGGRGATE (IS:6241)

Lab ID	:	**CP-RW-2018-09-03-01** **Date: 06-09-18**
Customer	:	Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.
Address	:	Byatarayanapura Sub Division, BBMP, Bangalore
Project Name	:	Improvements to road and drains at Markandaiahnagara, Agrahara layout cross roads in ward No.05 in Thirumenhalli village Limits.
Agency	:	B.R.Dhananjaya, Contractor, Nagashetehalli, Bangalore-560094.
Customer Reference	:	EE/BTP/BBMP/E-PMT/592/2013-14
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	03-09-18
Sample ID No	:	2018-09-03-01/01
Type of Mix	:	SDBC (Semi Dense Bituminous Concrete)
Date of test	:	03-09-18

Type of Binder	:	60/70
% of Binder Used	:	5.0%
Weight of Aggregate	:	200.0 gm
Weight of Binder	:	10.0 gm
Temperature of water bath	:	40°C

No of test	Retained Stripping Percentage	Stripping Percentage	Average Retained Stripping Percentage	Secified limits as per MORTH specification table 500-8
1	99.0	1.0	98.8	Minimum Retained Coating 95%
2	98.5	1.5		
3	99.0	1.0		

Note:-
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TESTS RESULTS ON STABILITY OF MIX

Lab ID	:	**CP-RW-2018-09-03-01** **Date: 06-09-18**
Customer	:	Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.
Address	:	Byatarayanapura Sub Division, BBMP, Bangalore
Project Name	:	Improvements to road and drains at Markandaiahnagara, Agrahara layout cross roads in ward No.05 in Thirumenhalli village Limits.
Agency	:	B.R.Dhananjaya, Contractor, Nagashetehalli, Bangalore-560094.
Customer Reference	:	EE/BTP/BBMP/E-PMT/592/2013-14
Source of Sample	:	Hot Mix Plant, Bangalore
Sample Condition	:	Satisfactory
Date of Receipt	:	03-09-18
Sample ID No	:	2018-09-03-01/01
Type of Mix	:	SDBC (Semi Dense Bituminous Concrete)
Date of test	:	03-09-18

The results of the tests conducted on the Semi Dense Bituminous Concrete mix sample are as follow

Sl.No	Particulars of observations	TEST 1	TEST 2	Secified limits as per MORTH specification table 500-16
1	Marshal Stability at 60°C, KN	10.54	10.21	8.2KN(min)
2	Marshal flow at 60°C, mm	3.22	3.28	2-4
3	Percent air Voids	4.59	4.26	3-5
4	Percent Voids in mineral Aggregate(VMA %)	13.88	13.85	13-15
5	Percent Voids filled with Bitumen(VFB %)	70.32	70.2	65-75
6	Density, g/cc	2.26	2.24	–

Note:-
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TEST RESULTS OF BITUMEN BINDAR CONTENT AND GRADATION FOR SDBC (IS 2386:(Part 1) 1963 (RA2011)

Lab ID : **CP-RW-2018-09-10-02** **Date: 11-09-18**

Customer : Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.

Address : Byatarayanapura Sub Division, BBMP, Bangalore

Project Name : Improvements to road and drains at Markandaiahnagara, Agrahara layout cross roads in ward No.05 in Thirumenhalli village Limits.

Agency : B.R.Dhananjaya, Contractor, Nagashetehalli, Bangalore-560094.

Customer Reference : EE/BTP/BBMP/E-PMT/592/2013-14

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 10-09-18

Sample ID No : 2018-09-10-02/01

Type of Mix : SDBC (Semi Dense Bituminous Concrete)

Date of test : 10-09-18

Sl.no	Description	Index	Trail 1	Trail 2
1	Weight of the Sample	A	502	501
2	Weight of the sample After extraction	B	478	477
3	Bitumen percentage	$\frac{A-B}{A} \times 100$	4.78	4.79
4	Average percentage	%	4.8	

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ab ID : CP-RW-2018-09-10-02

ample ID No : 2018-09-10-02/01

Date: 11-09-18

AFTER EXTRACTION(Trail-1)

Weight of Sample(gm) : 478

IS Sieve Size(mm)	Weight Retained(gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-15(grading-2)
13.2	0	0	0	100.0	100
9.5	31	31	6.49	93.5	90-100
4.75	213	244	51.05	49.0	35-51
2.36	63	307	64.23	35.8	24-39
1.18	39	346	72.38	27.6	15-30
0.3	71	417	87.24	12.8	9-19
0.075	34	451	94.35	5.6	3-8
PAN	27	478	100.00	0.0	0

AFTER EXTRACTION(Trail-2)

Weight of Sample(gm) : 477

IS Sieve Size(mm)	Weight Retained(gm)	Comulative Weight Retained (gm)	Comulative % of Retained	Comulative % of Passing	Secified limits as per MORTH specification table 500-15(grading-2)
13.2	0	0	0	100.0	100
9.5	29	29	6.08	93.9	90-100
4.75	215	244	51.15	48.8	35-51
2.36	62	306	64.15	35.8	24-39
1.18	41	347	72.75	27.3	15-30
0.3	66	413	86.58	13.4	9-19
0.075	32	445	93.29	6.7	3-8
PAN	32	477	100.00	0.0	0

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TEST RESULTS OF GRADATION FOR WMM

Lab ID	:	**CP-RW-2018-08-27-01** **Date: 29-08-18**
Customer	:	Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.
Address	:	Byatarayanapura Sub Division, BBMP, Bangalore
Project Name	:	Improvements to road and drains at Markandaiahnagara, Agrahara layout cross roads in ward No.05 in Thirumenhalli village Limits.
Agency	:	B.R.Dhananjaya, Contractor, Nagashetehalli, Bangalore-560094.
Customer Reference	:	EE/BTP/BBMP/E-PMT/592/2013-14
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	27-08-18
Sample ID No	:	2018-08-27-01/01
Type of Mix	:	WMM (Wet Mix Macadam)
Date of test	:	27-08-18
Oven Dry Weight	:	11000 Grams

IS Sieve Size(mm)	Weight Retained (gm)	Cumulative Weight Retained (gm)	% Cumulative Weight Retained	% Passing	Spec.I.Vide Table 400.13 MORTH Specification
53	0	0	0.0	100.0	100
45	202	202	1.8	98.2	95-100
22.4	2145	2347	21.3	78.7	60-80
11.2	2244	4591	41.7	58.3	40-60
4.75	2249	6840	62.2	37.8	25-40
2.36	1766	8606	78.2	21.8	15-30
0.6	745	9351	85.0	15.0	8-22
0.075	1266	10617	96.5	3.5	0-5

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TEST REPORT OF AGGEGRATE IMPACT VALUE
IS: 2386 Part IV

Lab ID	:	**CP-RW-2018-08-27-01** **Date: 29-08-18**
Customer	:	Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.
Address	:	Byatarayanapura Sub Division, BBMP, Bangalore
Project Name	:	Improvements to road and drains at Markandaiahnagara, Agrahara layout cross roads in ward No.05 in Thirumenhalli village Limits.
Agency	:	B.R.Dhananjaya, Contractor, Nagashetehalli, Bangalore-560094.
Customer Reference	:	EE/BTP/BBMP/E-PMT/592/2013-14
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	27-08-18
Sample ID No	:	2018-08-27-01/01
Type of Mix	:	Coarse Aggregate for WMM (Wet Mix Macadam)
Date of test	:	27-08-18

Sl.No	Particulars of observations	Index	TEST 1	TEST 2
1	Total weight of the surface dry sample sample (passing 12.5 mm and retained on 10mm sieve)	A	289.4	289.1
2	Weight of fraction passing 2.36mm sieve After giving 15 blows	B	68.9	69.5
3	weight of fraction retained 2.36mm sieve After giving 15 blows	C	220.1	219.1
4	Total weight of (B+C) is less than the initial weight (Weight A) by more than one gram the result shall be discarded and a fresh test made.	A-(B+C)	0.4	0.5
5	Aggregate impact value	(B/A)*100	23.8	24.0
6	Aggregate impact value (Mean of two tests)	Pecentage	23.9	

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DETERMINATION OF FLAKINESS INDEX AND ELONGATION INDEX OF COARSE AGGREGATE(IS 2386 (Part 1) 1963 (RA 2007)

Lab ID	:	**CP-RW-2018-08-27-01**	**Date: 29-08-18**
Customer	:	Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.	
Address	:	Byatarayanapura Sub Division, BBMP, Bangalore	
Project Name	:	Improvements to road and drains at Markandaiahnagara, Agrahara layout cross roads in ward No.05 in Thirumenhalli village Limits.	
Agency	:	B.R.Dhananjaya, Contractor, Nagashetehalli, Bangalore-560094.	
Customer Reference	:	EE/BTP/BBMP/E-PMT/592/2013-14	
Source of Sample	:	Sample supplied by Agency	
Sample Condition	:	Satisfactory	
Date of Receipt	:	27-08-18	
Sample ID No	:	2018-08-27-01/01	
Type of Mix	:	Coarse Aggregate for WMM (Wet Mix Macadam)	
Date of test	:	27-08-18	

Result:

Index	Percentage of Flakiness and Elongation Index	Secified limits as per MORTH specification table 400-12
Flakiness Index	11.5%	Combined Flakiness & Elongation Index for WMM is Maximum 35%
Elongation Index	11.9%	
Combined Flakiness and Elongation Index for WMM	23.4%	

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PHYSICAL REQUIREMENTS FOR COARSE AGGREGATE FOR SEMI DENSE BITUMINOUS CONCRETE

Lab ID	:	**CP-RW-2018-09-03-01**	**Date: 06-09-18**
Customer	:	Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.	
Address	:	Byatarayanapura Sub Division, BBMP, Bangalore	
Project Name	:	Improvements to road and drains at Markandaiahnagara, Agrahara layout cross roads in ward No.05 in Thirumenhalli village Limits.	
Agency	:	B.R.Dhananjaya, Contractor, Nagashetehalli, Bangalore-560094.	
Customer Reference	:	EE/BTP/BBMP/E-PMT/592/2013-14	
Source of Sample	:	Sample supplied by Agency	
Sample Condition	:	Satisfactory	
Date of Receipt	:	03-09-18	
Sample ID No	:	2018-09-03-01/01	
Type of Mix	:	SDBC (Semi Dense Bituminous Concrete)	
Date of test	:	03-09-18	

Physical Requirements fo Coarse Aggregate for Semi Dense Bituminous Concrete

Property	Test	Result	Specification	Method of Test
Partical Shape	Flakiness Index	11.2	Combined Flakiness & Elongation Index for DBM is Maximum 35%	IS:2386 Part I
	Elongation Index	9.5		
Strength	Aggregate Impact Value	21.7	Maximum 30%	IS:2386 Part IV
Specific gravity	Specific gravity	2.58	Maximum 2.7	IS:2386 Part III
Water Absorption	Water Absorption	0.31	Maximum 2%	IS:2386 Part III

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TEST REPORT ON BITUMEN

Lab ID	:	**CP-2018-08-30-01** **Date: 31-08-18**
Customer	:	Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.
Address	:	Byatarayanapura Sub Division, BBMP, Bangalore
Project Name	:	Improvements to road and drains at Markandaiahnagara, Agrahara layout cross roads in ward No.05 in Thirumenhalli village Limits.
Agency	:	B.R.Dhananjaya, Contractor, Nagashetehalli, Bangalore-560094.
Customer's Reference	:	EE/BTP/BBMP/E-PMT/592/2013-14
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	30-08-18
Sample ID No	:	2018-08-30-01/01
Sample Type	:	Bitumen
Reference to BIS codes	:	IS: 1201-1220(1978) (Reaffirmed-2004)
Date of test	:	30-08-18

Test Results

Sl.no	Name of Test	Result	Requirements as per IS:73-2013
1	Penetration at 25°C , in 1/10th mm	**62**	60 to 70
2	Softening Point, °C	**46.2**	Min. 40°C
3	Ductility, cm	**93**	Min. 75cm
4	Flash point, °C	**239**	Min. 220°C
	Fire point, °C	**251**	

Note:-

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TEST REPORT OF PHYSICAL PROPERTIES OF CEMENT - 53 Grade

Lab ID	:	**CP-2018-08-02-01** **Date: 04-08-18**
Customer	:	Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP,
Address	:	Byatarayanapura Sub Division, BBMP, Bangalore
Project Name	:	Improvements to road and drains at Markandaiahnagara, Agrahara layout cross roads in ward No.05 in Thirumenhalli village Limits.
Agency	:	B.R.Dhananjaya, Contractor, Nagashetehalli, Bangalore-560094.
Customer's Reference	:	EE/BTP/BBMP/E-PMT/592/2013-14
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	02-08-18
Sample ID No	:	2018-08-02-01 /01
Sample Type	:	Birla Super 53grade
Reference to BIS codes	:	IS 12269 : 2013, 53 Grade Ordinary Portland cement Specification , IS 4031 (Part 1,2 3,4,5, 6,11):1988 IS 4031 Part 1 DETERMINATION OF FINENESS BY DRY SIEVING, Clause 4.4 IS 4031 Part 2, Determination of Fineness by Blaine Air Permeability Method, Clause 5 IS 4031 Part 3, Determination of Soundness, Clause 5,Clause 6 IS 4031 Part 4, Determination of Consistency of Standard Cement Paste, Clause 5 IS 4031 Part 5, Determination of Initial & Final Setting Time, Clause 5 IS 4031 Part 11,DETERMINATION OF DENSITY , Clause 6
Date of test	:	02-08-18
Environmental Conditions during test	:	Temperature: 26°C Humidity: 72%

Sl.No.	Physical properties	Results	Requirement as per IS 12269: 2013
1	Fineness by dry sieving (%)	1.95	_
2	Finess by Air permeablity method (m^2/kg,Min)	285.4	225m^2/kg, Min
3	Density (gm/cc)	3.12	_
4	Standard Consistency (%)	29.5%	Not specified
5	Initial Setting time	145 minutes	Not less than 30 minutes
6	Final Setting time	240 minutes	Not more than 600 minutes
7	Soundness (Le Chatelier's Method)	1.5mm	Not more than 10 mm

Note:

The results pertain to the samples received and tested.

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M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

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TEST REPORT OF PHYSICAL PROPERTIES OF CEMENT - 53 Grade

Lab ID	:	**CP-2018-08-02-01** **Date: 31-08-18**
Customer	:	Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.
Address	:	Byatarayanapura Sub Division, BBMP, Bangalore
Project Name	:	Improvements to road and drains at Markandaiahnagara, Agrahara layout cross roads in ward No.05 in Thirumenhalli village Limits.
Agency	:	B.R.Dhananjaya, Contractor, Nagashetehalli, Bangalore-560094.
Customer's Reference	:	EE/BTP/BBMP/E-PMT/592/2013-14
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	02-08-18
Sample ID No	:	2018-08-02-01 /01
Sample Type	:	Birla Super 53grade
Reference to BIS codes	:	IS 12269 : 2013, 53 Grade Ordinary Portland cement Specification , IS 4031 Part 4, Determination of Consistency of Standard Cement Paste, Clause 5 IS 4031 Part 6, Determination of Compressive Strength, Clause 6
Date of test	:	03-08-18
Environmental Conditions during test	:	Temperature: 26˚C Humidity: 72%

Compressive Strength

Sl.No.	Physical properties	Results	Requirement as per IS 12269: 2013
1	3 Days	27.5N/mm2	Not less than 27 N/mm^2
2	7 Days	38.5N/mm2	Not less than 37 N/mm^2
3	28 Days	58.5N/mm2	Not less than 53 N/mm^2

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TEST REPORT ON COARSE AGGREGATES

Lab ID	:	**CP-2018-08-02-01** **Date: 04-08-18**
Customer	:	Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.
Address	:	Byatarayanapura Sub Division, BBMP, Bangalore
Project Name	:	Improvements to road and drains at Markandaiahnagara, Agrahara layout cross roads in ward No.05 in Thirumenhalli village Limits.
Agency	:	B.R.Dhananjaya, Contractor, Nagashetehalli, Bangalore-560094.
Customer's Reference	:	EE/BTP/BBMP/E-PMT/592/2013-14
Source of Sample	:	Sample supplied by Agency
Sample condition	:	Satisfactory
Date of Receipt	:	02-08-18
Sample ID No	:	2018-08-02-01 /02(a)
Sample Type	:	40mm down size coarse aggregate
Reference to BIS codes	:	IS: 383:2016 (Specification for Coarse and fine Aggregates) IS: 2386 :1963(Part - 1,3,4) RA2011 IS 2386 Part 1: Particle Size and Shape IS 2386 Part 3: Specific gravity, Density, Voids,Water Absorption IS 2386 Part 4: Mechanical Properties
Date of test	:	02-08-18

SIEVE ANALYSIS (PARTICLE SIZE DISTRIBUTION) OF 40MM DOWN COARSE AGGREGATE:

Total weight taken : 15000 grams

Sample No.	Sieve No.	Weight Retained in gms	Cumulative Weight Retained in gms	% Cumulative Weight Retained	% Passing	Required as per IS 383:2016
1	80 mm	0	0	0.0	100	100
2	40 mm	244	244	1.6	98.4	90-100
3	20 mm	5432	5676	37.8	62.2	30-70
4	10 mm	4332	10008	66.7	33.3	10-35
5	4.75 mm	4654	14662	97.7	2.3	0-5
6	Pan	338	15000	100.0	0	---

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TEST REPORT ON COARSE AGGREGATES

Lab ID : **CP-2018-08-02-01** **Date: 04-08-18**

Sample ID No : 2018-08-02-01 /02(a)

PHYSICAL PROPERTIES

Sl.no	Tests	Result	Requirements as per IS:383-2016
1	Flakiness Index(%)	**12.4**	Combined Flakiness & Elongation Index Shall not Exceed 40% for Uncrushed & Crushed Aggregate
2	Elongation Index(%)	**11.8**	
3	Specific Gravity	**2.68**	_
4	Bulk Density(Loose) (Kg/l)	**1.48**	_
5	Bulk Density(Compacted) (Kg/l)	**1.52**	_
6	Water Absorption(%)	**0.22**	_

Note:
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TEST REPORT ON COARSE AGGREGATES

Lab ID	:	**CP-2018-08-02-01** **Date: 04-08-18**
Customer	:	Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.
Address	:	Byatarayanapura Sub Division, BBMP, Bangalore
Project Name	:	Improvements to road and drains at Markandaiahnagara, Agrahara layout cross roads in ward No.05 in Thirumenhalli village Limits.
Agency	:	B.R.Dhananjaya, Contractor, Nagashetehalli, Bangalore-560094.
Customer Reference	:	EE/BTP/BBMP/E-PMT/592/2013-14
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	02-08-18
Sample ID No	:	2018-08-02-01 /02(b)
Sample Type/ Size	:	20mm down size coarse aggregate
Reference to BIS codes	:	IS: 383:2016 (Specification for Coarse and fine Aggregates) IS: 2386 :1963(Part - 1,3,4) RA2011 IS 2386 Part 1: Particle Size and Shape IS 2386 Part 3: Specific gravity, Density, Voids,Water Absorption IS 2386 Part 4: Mechanical Properties
Date of test	:	02-08-18

SIEVE ANALYSIS (PARTICLE SIZE DISTRIBUTION) OF 20MM DOWN COARSE AGGREGATE:

Total weight taken : 5000 grams

Sample No.	Sieve No.	Weight Retained in gms	Cumulative Weight Retained in gms	% Cumulative Weight Retained	% Passing	Required as per IS 383:2016
1	40 mm	0	0	0	100	100
2	20 mm	245	245	4.9	95.1	90-100
3	10 mm	2560	2805	56.1	43.9	25-55
4	4.75 mm	2033	4838	96.8	3.2	0-10
5	Pan	162	5000	100	0	_

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TEST REPORT ON COARSE AGGREGATES

Lab ID : **CP-2018-08-02-01** **Date: 04-08-18**

Sample ID No : 2018-08-02-01 /02(b)

PHYSICAL PROPERTIES

Sl.no	Tests	Result	Requirements as per IS:383-2016
1	Flakiness Index(%)	13.2	Combined Flakiness & Elongation Index Shall not Exceed 40% for Uncrushed & Crushed Aggregate
2	Elongation Index(%)	12.6	
3	Specific Gravity	2.66	–
4	Bulk Density(Loose) (Kg/l)	1.54	–
5	Bulk Density(Compacted) (Kg/l)	1.58	–
6	Water Absorption(%)	0.22	–
7	Aggregate crushing Value(%)	24.5	Max 30% for Aggregates to be used in concrete for wearing Surface, In case Aggregate Crushing Value Exceeds 30% then the test for ten percent fines should be conducted for Aggregates to be used in concrete other than for wearing Surface.
8	Aggregate Impact Value(%)	22.8	30% for Aggregates to be used in concrete for wearing Surface, 45% for Aggregates to be used in concrete other than for wearing Surface.

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TEST REPORT OF FINE AGGREGATE

Lab ID : **CP-2018-08-02-01** **Date: 04-08-18**

Customer : Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.

Address : Byatarayanapura Sub Division, BBMP, Bangalore

Project Name : Improvements to road and drains at Markandaiahnagara, Agrahara layout cross roads in ward No.05 in Thirumenhalli village Limits.

Agency : B.R.Dhananjaya, Contractor, Nagashetehalli, Bangalore-560094.

Customer's Reference : EE/BTP/BBMP/E-PMT/592/2013-14

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 02-08-18

Sample ID No : 2018-08-02-01 /03

Sample Type : Fine Aggregate

Reference to BIS codes : IS 383 : 2016 (Specification for Coarse and fine Aggregates)
IS: 2386 :1963(Part - 1, 3) RA2012
IS 2386 Part 1: Particle Size and Shape
IS 2386 Part 3: Specific gravity, Density, Voids,Water Absorption

Date of test : 02-08-18

Total weight taken : 1000 grams

Sl.no	Sieve Size	Weight Retained (gms)	Cumulative Weight Retained (gms)	% Cumulative Weight Retained	% Passing	Requirement as per IS 383:2016			
						Grading Zone I	Grading Zone II	Grading Zone III	Grading Zone IV
1	10 mm	0	0	0.0	100.0	100	100	100	100
2	4.75 mm	21	21	2.1	97.9	90-100	90-100	90-100	95-100
3	2.36 mm	185	206	20.6	79.4	60-95	75-100	85-100	95-100
4	1.18 mm	201	407	40.7	59.3	30-70	55-90	75-100	90-100
5	600 micron	168	575	57.5	42.5	15-34	35-59	60-79	80-100
6	300 micron	229	804	80.4	19.6	5-20	8-30	12-40	15-50
7	150 micron	153	957	95.7	4.3	0-10	0-10	0-10	0-15
8	Pan	43	1000	100.0	0.0	---	---	---	---
Result :The tested Sample Conforms to Grading Zone II									

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TEST REPORT OF FINE AGGREGATE

Lab ID : **CP-2018-08-02-01** **Date: 04-08-18**

Sample ID No : 2018-08-02-01 /03

PHYSICAL PROPERTIES

Sl.no	Tests	Result	Requirements as per IS 383:2016
1	Water Absorption(%)	1.42	–
2	Specific Gravity	2.53	–
3	Material finer than 75 micron(%)	3.9	Uncrushed fine Aggregate Max 3%, Crushed Fine aggregate Max 15%, Mixed Fine aggregate Max 12%, Manufactured Fine aggregate Max 10%

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TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID : **CP-2018-08-16-01** **Date: 20/08/2018**

Customer : Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.

Address : Byatarayanapura Sub Division, BBMP, Bangalore

Project Name : Improvements to road and drains at Markandaiahnagara, Agrahara layout cross roads in ward No.05 in Thirumenhalli village Limits.

Agency : B.R.Dhananjaya, Contractor, Nagashetehalli, Bangalore-560094.

Customer's Reference : EE/BTP/BBMP/E-PMT/592/2013-14

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 16-08-18

Sample ID No : 2018-08-16-01 /01

Customer ID : M20 Concrete

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M20 / 7 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5

Date of test : 20/08/2018

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	M20 Concrete	M20	13/08/2018	20/08/2018	150.05 X 149.87 X 151.30	22488	8.198	407.8	18.1	18.5
2	M20 Concrete	M20	13/08/2018	20/08/2018	149.20 X 149.67 X 151.07	22332	8.317	415.8	18.6	
3	M20 Concrete	M20	13/08/2018	20/08/2018	151.93 X 150.18 X 149.94	22818	8.255	427.4	18.7	

Note:

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Format No: CP/TF/01

TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID	:	**CP-2018-08-16-01** **Date: 10/09/2018**
Customer	:	Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.
Address	:	Byatarayanapura Sub Division, BBMP, Bangalore
Project Name	:	Improvements to road and drains at Markandaiahnagara, Agrahara layout cross roads in ward No.05 in Thirumenhalli village Limits.
Agency	:	B.R.Dhananjaya, Contractor, Nagashetehalli, Bangalore-560094.
Customer's Reference	:	EE/BTP/BBMP/E-PMT/592/2013-14
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	16-08-18
Sample ID No	:	2018-08-16-01 /02
Customer ID	:	M20 Concrete
Sample Type /Size	:	150X150X150 mm
Sample grade/Age	:	M20 / 28 Days Compressive Strength
Reference to BIS codes	:	IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5
Date of test	:	10/09/2018

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	M20 Concrete	M20	13/08/2018	10/09/2018	149.26 X 149.25 X 149.39	22278	8.070	517.2	23.2	22.9
2	M20 Concrete	M20	13/08/2018	10/09/2018	150.29 X 149.88 X 151.31	22525	8.397	498.4	22.1	
3	M20 Concrete	M20	13/08/2018	10/09/2018	151.42 X 150.84 X 149.33	22839	8.554	536.5	23.5	

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TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID : **CP-2018-08-16-01** **Date: 20/08/2018**

Customer : Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.

Address : Byatarayanapura Sub Division, BBMP, Bangalore

Project Name : Improvements to road and drains at Markandaiahnagara, Agrahara layout cross roads in ward No.05 in Thirumenhalli village Limits.

Agency : B.R.Dhananjaya, Contractor, Nagashetehalli, Bangalore-560094.

Customer's Reference : EE/BTP/BBMP/E-PMT/592/2013-14

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 16-08-18

Sample ID No : 2018-08-16-01 /03

Customer ID : M20 Concrete

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M20 / 7 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5

Date of test : 20/08/2018

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	M20 Concrete	M20	13/08/2018	20/08/2018	150.72 X 150.97 X 150.78	22753	8.104	411.6	18.1	18.3
2	M20 Concrete	M20	13/08/2018	20/08/2018	151.93 X 151.09 X 151.39	22956	8.487	416.5	18.1	
3	M20 Concrete	M20	13/08/2018	20/08/2018	150.30 X 149.12 X 150.21	22413	8.124	418.3	18.7	

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TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID : **CP-2018-08-16-01** **Date: 10/09/2018**

Customer : Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.

Address : Byatarayanapura Sub Division, BBMP, Bangalore

Project Name : Improvements to road and drains at Markandaiahnagara, Agrahara layout cross roads in ward No.05 in Thirumenhalli village Limits.

Agency : B.R.Dhananjaya, Contractor, Nagashetehalli, Bangalore-560094.

Customer's Reference : EE/BTP/BBMP/E-PMT/592/2013-14

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 16-08-18

Sample ID No : 2018-08-16-01 /04

Customer ID : M20 Concrete

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M20 / 28 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5

Date of test : 10/09/2018

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	M20 Concrete	M20	13/08/2018	10/09/2018	150.80 X 151.86 X 149.23	22901	8.280	544.8	23.8	23.3
2	M20 Concrete	M20	13/08/2018	10/09/2018	150.01 X 151.14 X 149.07	22673	8.098	501.5	22.1	
3	M20 Concrete	M20	13/08/2018	10/09/2018	150.03 X 149.12 X 149.10	22372	8.290	535.8	23.9	

Note:

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FOR CIVIL Pro.

CIVIL PRO Sig..... Date..... BANGALORE

R RUDRAPRASAD
Authorized Signatory
Technical Manager

****End of Report****

M : 9972924526 | Tel : +91 80 23444801 | e : rechan6630@yahoo.co.in, civilproexperts@gmail.com

HIGHWAY & BUILDING MATERIALS TESTING LABORATORY | STRUCTURAL |
GEO TECHNICAL | PROJECT MANAGEMENT | SURVEYING SERVICES |

Format No: CP/TF/01

TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID : **CP-2018-08-16-01** **Date: 20/08/2018**

Customer : Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.

Address : Byatarayanapura Sub Division, BBMP, Bangalore

Project Name : Improvements to road and drains at Markandaiahnagara, Agrahara layout cross roads in ward No.05 in Thirumenhalli village Limits.

Agency : B.R.Dhananjaya, Contractor, Nagashetehalli, Bangalore-560094.

Customer's Reference : EE/BTP/BBMP/E-PMT/592/2013-14

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 16-08-18

Sample ID No : 2018-08-16-01 /05

Customer ID : M20 Concrete

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M20 / 7 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5

Date of test : 20/08/2018

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	M20 Concrete	M20	13/08/2018	20/08/2018	149.50 X 149.22 X 150.41	22310	8.562	416.7	18.7	18.6
2	M20 Concrete	M20	13/08/2018	20/08/2018	151.95 X 151.97 X 151.14	23093	8.153	416.6	18.0	
3	M20 Concrete	M20	13/08/2018	20/08/2018	149.04 X 149.94 X 150.76	22348	8.263	423.2	18.9	

Note:

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Format No: CP/TF/01

TEST REPORT OF CEMENT CONCRETE CUBES

ab ID	:	**CP-2018-08-16-01** **Date: 10/09/2018**
Customer	:	Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.
Address	:	Byatarayanapura Sub Division, BBMP, Bangalore
Project Name	:	Improvements to road and drains at Markandaiahnagara, Agrahara layout cross roads in ward No.05 in Thirumenhalli village Limits.
Agency	:	B.R.Dhananjaya, Contractor, Nagashetehalli, Bangalore-560094.
Customer's Reference	:	EE/BTP/BBMP/E-PMT/592/2013-14
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	16-08-18
Sample ID No	:	2018-08-16-01 /06
Customer ID	:	M20 Concrete
Sample Type /Size	:	150X150X150 mm
Sample grade/Age	:	M20 / 28 Days Compressive Strength
Reference to BIS codes	:	IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5

Date of test : 10/09/2018

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	M20 Concrete	M20	13/08/2018	10/09/2018	149.61 X 151.27 X 149.29	22632	8.291	541.3	23.9	23.2
2	M20 Concrete	M20	13/08/2018	10/09/2018	149.68 X 151.52 X 150.08	22679	8.384	506.7	22.3	
3	M20 Concrete	M20	13/08/2018	10/09/2018	151.58 X 151.18 X 150.04	22916	8.004	532.9	23.3	

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TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID : **CP-2018-08-16-01** **Date: 20/08/2018**

Customer : Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.

Address : Byatarayanapura Sub Division, BBMP, Bangalore

Project Name : Improvements to road and drains at Markandaiahnagara, Agrahara layout cross roads in ward No.05 in Thirumenhalli village Limits.

Agency : B.R.Dhananjaya, Contractor, Nagashetehalli, Bangalore-560094.

Customer's Reference : EE/BTP/BBMP/E-PMT/592/2013-14

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 16-08-18

Sample ID No : 2018-08-16-01 /07

Customer ID : M20 Concrete

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M20 / 7 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5

Date of test : 20/08/2018

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	M20 Concrete	M20	13/08/2018	20/08/2018	149.30 X 151.49 X 150.91	22618	7.960	413.9	18.3	18.3
2	M20 Concrete	M20	13/08/2018	20/08/2018	149.87 X 150.64 X 149.01	22577	8.253	410.9	18.2	
3	M20 Concrete	M20	13/08/2018	20/08/2018	151.97 X 151.16 X 150.48	22971	8.335	422.7	18.4	

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TEST REPORT OF CEMENT CONCRETE CUBES

Lab ID	:	**CP-2018-08-16-01** **Date: 10/09/2018**
Customer	:	Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.
Address	:	Byatarayanapura Sub Division, BBMP, Bangalore
Project Name	:	Improvements to road and drains at Markandaiahnagara, Agrahara layout cross roads in ward No.05 in Thirumenhalli village Limits.
Agency	:	B.R.Dhananjaya, Contractor, Nagashetehalli, Bangalore-560094.
Customer's Reference	:	EE/BTP/BBMP/E-PMT/592/2013-14
Source of Sample	:	Sample supplied by Agency
Sample Condition	:	Satisfactory
Date of Receipt	:	16-08-18
Sample ID No	:	2018-08-16-01 /08
Customer ID	:	M20 Concrete
Sample Type /Size	:	150X150X150 mm
Sample grade/Age	:	M20 / 28 Days Compressive Strength
Reference to BIS codes	:	IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5
Date of test	:	10/09/2018

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	M20 Concrete	M20	13/08/2018	10/09/2018	149.70 X 149.60 X 149.81	22396	8.349	508.4	22.7	23.2
2	M20 Concrete	M20	13/08/2018	10/09/2018	149.55 X 149.67 X 150.98	22382	8.285	526.0	23.5	
3	M20 Concrete	M20	13/08/2018	10/09/2018	151.62 X 150.86 X 149.90	22874	8.507	535.2	23.4	

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Lab ID : **CP-2018-08-16-01** **Date: 20/08/2018**

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Address : Byatarayanapura Sub Division, BBMP, Bangalore

Project Name : Improvements to road and drains at Markandaiahnagara, Agrahara layout cross roads in ward No.05 in Thirumenhalli village Limits.

Agency : B.R.Dhananjaya, Contractor, Nagashetehalli, Bangalore-560094.

Customer's Reference : EE/BTP/BBMP/E-PMT/592/2013-14

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 16-08-18

Sample ID No : 2018-08-16-01 /09

Customer ID : M20 Concrete

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M20 / 7 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5

Date of test : 20/08/2018

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	M20 Concrete	M20	13/08/2018	20/08/2018	149.50 X 149.22 X 150.41	22310	8.562	410.5	18.4	18.6
2	M20 Concrete	M20	13/08/2018	20/08/2018	151.95 X 151.97 X 151.14	23093	8.153	427.2	18.5	
3	M20 Concrete	M20	13/08/2018	20/08/2018	149.04 X 149.94 X 150.76	22348	8.263	422.4	18.9	

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ID : **CP-2018-08-16-01** **Date: 10/09/2018**

ustomer : Assistant Executive Engineer, Byatarayanapura Sub Division, BBMP, Bangalore.

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Agency : B.R.Dhananjaya, Contractor, Nagashetehalli, Bangalore-560094.

Customer's Reference : EE/BTP/BBMP/E-PMT/592/2013-14

Source of Sample : Sample supplied by Agency

Sample Condition : Satisfactory

Date of Receipt : 16-08-18

Sample ID No : 2018-08-16-01 /10

Customer ID : M20 Concrete

Sample Type /Size : 150X150X150 mm

Sample grade/Age : M20 / 28 Days Compressive Strength

Reference to BIS codes : IS: 516 - 1959 Methods of Tests for Strength of Concrete Cl.5

Date of test : 10/09/2018

Sl. No.	Identification Mark	Grade of concrete	Date of Casting	Date of Testing	Dimension of the Specimen (mm)	Cross sectional area (Sq.mm)	Weight of the sample (kg)	Failure Load (KN)	Compressive strength (N/mm^2)	Average Compressive Strength (N/mm^2)
1	M20 Concrete	M20	13/08/2018	10/09/2018	149.61 X 151.27 X 149.29	22632	8.291	511.5	22.6	22.9
2	M20 Concrete	M20	13/08/2018	10/09/2018	149.68 X 151.52 X 150.08	22679	8.384	514.8	22.7	
3	M20 Concrete	M20	13/08/2018	10/09/2018	151.58 X 151.18 X 150.04	22916	8.004	536.2	23.4	

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